

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) An automatic staining apparatus comprising:
at least one removable reagent container positioned within a reagent section;
at least one slide positioned within a slide section;

[[a]] wherein the robotic element adapted to affect said reagent container and said is configured to move above the reagent section and above the slide section during a staining process;

wherein the reagent section is situated to enable the at least one removable reagent container to be added to or removed from the apparatus without interrupting the movement of the robotic element during the staining process;

a control element to which said robotic element is responsive; and

wherein the robotic element comprises an image-capture 2-D optical sensor configured to two-dimensionally image at least one element in said automatic staining apparatus; automatically identify new slides and reagent bottles loaded into the apparatus during the staining process; and

a control element to which the robotic element is responsive, wherein the control element monitors configured to monitor insertion or removal of the at least one removable reagent container and the at least one slide during processing protocol steps the staining process.

2. (Original) An apparatus according to claim 1, wherein the optical sensor is adapted to locate pre-selected reference features for self-calibration of the robotic element.

3. (Currently Amended) An apparatus according to claim 1, wherein a sample is placed on the at least one slide, and

wherein the optical sensor is adapted to record an image of the finalised sample after said sample has been subjected to ~~a staining protocol~~ the staining process.

4. (Currently Amended) An apparatus according to claim [[1]] 3, further comprising:

at least one element provided on the at least one removable reagent container and the at least one slide;

wherein at least one element comprises an element selected from a group consisting of: a two-dimensional high-resolution symbology code, a datamatrix code, a bar code, an adhesive label, a two dimensional symbology zone, and a human readable text zone[[: and]]

~~wherein the optical sensor is adapted to record an image of the finalised sample after said tissue sample has been subjected to a staining protocol.~~

5. (Currently Amended) An apparatus according to claim [[1]] 3, wherein the optical sensor is configured to identify a feature selected from a group consisting of: the

texture of the sample, the outline of the sample, a visual property of the sample, and an individual identification feature of the sample[; and]]

~~wherein the optical sensor is adapted to record an image of the finalised sample after said sample has been subjected to a staining protocol.~~

6. (Currently Amended) A method of identifying at least one property in an automatic staining apparatus comprising the steps of:

providing at least one sample on a slide positioned within a slide section;

providing at least one reagent container positioned within a reagent section;

~~providing a wherein the robotic element adapted to affect said reagent container and said sample is configured to move above the slide section and above the reagent section during a staining process;~~

wherein the at least one reagent container is added to or removed from the apparatus without interrupting the staining process;

optically sensing a two dimensional image of at least one element in said automatic staining providing the robotic element with an optical sensor configured to automatically identify new slides and reagent bottles loaded into the apparatus during the staining process;

recording relevant image data;

recording calibration reference points of the apparatus; and

feeding said image data to a control element to which said robotic element is responsive, the control element configured to monitor insertion or removal of the at least one reagent container during the staining process.

7. (Currently Amended) A method of staining samples in an automatic staining apparatus comprising the steps of:

providing at least one sample on a slide, the slide being positioned in a slide section within slide racks;

~~providing slides in slide racks;~~

providing at least one reagent container positioned within a reagent section;

~~providing a wherein the robotic element adapted to affect said reagent container and said sample is configured to move above the slide section and above the reagent section during a staining process;~~

wherein the at least one reagent container is added to or removed from the apparatus without interrupting the staining process;

~~providing the robotic element with an optical sensor responsive to said robotic element and adapted to sense a two dimensional image of at least one element in said automatic staining apparatus~~ configured to automatically identify new slides and reagent bottles loaded into the apparatus during the staining process;

~~recording relevant image data;~~

~~recording calibration reference positions for said slide racks; and~~

~~feeding said image data to a control element to which said robotic element is responsive, the control element configured to monitor insertion or removal of the at least one reagent container during the staining process.~~

8. (Currently Amended) An automatic staining apparatus comprising:

at least one reagent container positioned within a reagent section;

at least one sample, ~~the sample being placed~~ on a slide, the slide being positioned within a slide section;

~~[[a]] wherein the robotic element adapted to affect said reagent container and said sample is configured to move above the reagent section and above the slide section during a staining process;~~

wherein the reagent section is situated to enable the at least one reagent container to be added to or removed from the apparatus without interrupting the movement of the robotic element during the staining process;

~~a control element to which said robotic element is responsive; and~~

wherein the robotic element comprises an optical sensor adapted to configured to automatically identify new slides and reagent bottles loaded into the apparatus during the staining process and locate pre-selected reference features for self-calibration of the robotic element~~[[,]]; and~~

a control element to which the robotic element is responsive, wherein the control element monitors configured to monitor insertion or removal of the slide during processing protocol steps at least one reagent container during the staining process.

9. (Currently Amended) An automatic staining apparatus comprising:

at least one reagent container in a reagent section;

at least one first sample contained on a slide in a first slide section;

at least one second sample contained on a slide in a second slide section,
wherein said first slide section and said second slide section are separated by said
reagent section;

[[a]] ~~wherein the robotic element adapted to affect said reagent container and~~
~~said first and said second samples~~ is configured to move above the reagent section and
above the first and second slide sections during a staining process; [[and]]

wherein the reagent section is situated to enable the at least one reagent
container to be added to or removed from the apparatus without interrupting the
movement of the robotic element during the staining process; and

a control element to which said robotic element is responsive, the control
element configured to monitor insertion or removal of the at least one reagent container
during the staining process.

10. (Currently Amended) An automatic staining apparatus comprising:
at least one reagent container positioned within a reagent section;
at least one sample, ~~the sample being placed on a slide, the slide being~~
positioned within a slide section;

[[a]] ~~wherein the robotic element adapted to affect said reagent container and~~
~~said sample~~ is configured to move above the reagent section and above the slide
section during a staining process;

wherein the reagent section is situated to enable the at least one reagent container to be added to or removed from the apparatus without interrupting the movement of the robotic element during the staining process;

a control element to which said robotic element is responsive; and
wherein the robotic element comprises an image capture 2-D optical sensor configured to two dimensionally image at least one element in said automatic staining apparatus, wherein said at least one element comprises an optical identification element having reiterated information, automatically identify new slides and reagent bottles loaded into the apparatus during the staining process and image at least one optical identification element; and

wherein the a control element uses the optical identification element to which the robotic element is responsive, the control element configured to monitor insertion or removal of the slide during processing protocol steps at least one reagent container during the staining process using the optical identification element.

11. (Currently Amended) An apparatus according to claim 10 wherein the optical identification element has reiterated information, said reiterated information comprises multiple reiterated information.

12. (Currently Amended) An apparatus according to claim ~~[[10]]~~ 11 wherein said reiterated information comprises redundant information.

13. (Cancelled)

14. (Original) An apparatus according to claim 11 wherein said optical identification element comprises a two-dimensional high-resolution symbology code.

15. (Original) An apparatus according to claim 11 wherein said optical identification element comprises a datamatrix code.

16. (Original) An apparatus according to claim 11 wherein said optical identification element comprises a bar code.

17. (Currently Amended) An automatic staining apparatus comprising:
at least one reagent container positioned within a reagent section;
at least one sample on a slide, the slide being positioned within a slide section;
[[a]] wherein the robotic element adapted to affect said reagent container and said sample is configured to move above the reagent section and above the slide section during a staining process;

wherein the reagent section is situated to enable the at least one reagent container to be added to or removed from the apparatus without interrupting the movement of the robotic element during the staining process;

a control element to which said robotic element is responsive;

wherein the robotic element comprises an image capture 2-D optical sensor configured to two dimensionally image at least one element in said automatic staining

apparatus automatically identify new slides and reagent bottles loaded into the apparatus during the staining process; [[and]]

a computer image biological analysis element[[,]]; and
a control element to which the robotic element is responsive, the control element configured to monitor insertion or removal of the at least one reagent container during the staining process.

wherein the [[2-D]] optical sensor records a first image of the at least one sample before staining and records a second image of the sample after staining.

18. (Original) An apparatus according to claim 17 wherein said optical sensor comprises a camera.

19. (Original) An apparatus according to claim 18, wherein said camera comprises a CCD element.

20. (Cancelled)

21. (Currently Amended) A method of identifying at least one property in an automatic staining apparatus comprising the steps of:

providing at least one sample, the sample being placed on a slide in a removable slide rack, the slide rack being positioned within a slide section;

providing at least one reagent container positioned within a reagent section;

~~providing a wherein the robotic element adapted to affect said reagent container and said sample is configured to move above the reagent section and above the slide section during a staining process;~~

~~wherein the at least one reagent container is added to or removed from the apparatus without interrupting the staining process;~~

~~optically sensing a two dimensional image of at least one element in said automatic staining apparatus providing the robotic element with an optical sensor configured to automatically identify new slides and reagent bottles loaded into the apparatus during the staining process;~~

~~recording relevant image data;~~

~~feeding said image data to a control element to which said robotic element is responsive, the control element configured to monitor insertion or removal of the at least one reagent container during the staining process; and~~

~~biologically analysing image data of said at least one sample with a computer[[,]]~~

~~wherein the control element monitors insertion or removal of the slide rack during processing protocol steps.~~

22. (Currently Amended) A method according to claim 21, wherein said step of ~~optically sensing the two dimensional image of at least one element in said automatic staining apparatus comprises the step of utilizing~~ optical sensor comprises a camera.

23. (Currently Amended) A method according to claim 22, wherein said step of ~~utilizing a camera comprises the step of utilizing~~ a CCD element.

24. (Cancelled)

25. (Currently Amended) A method of staining tissue samples in an automatic staining apparatus comprising the steps of:

providing at least one removable sample on at least one slide positioned within a slide section;

providing at least one reagent container positioned within a reagent section;

~~providing a wherein the~~ robotic element adapted to affect said reagent container and said sample is configured to move above the reagent section and above the slide section during a staining process;

wherein the at least one reagent container is be added to or removed from the apparatus without interrupting the staining process;

providing the robotic element with an optical sensor ~~responsive to said robotic element and adapted to sense a two dimensional image of at least one element in said automatic staining apparatus~~ configured to automatically identify new slides and reagent bottles loaded into the apparatus during the staining process;

recording relevant image data;

feeding said image data to a control element to which said robotic element is responsive, the control element configured to monitor insertion or removal of the at least one reagent container during the staining process; and

biologically analysing image data of said at least one sample with a computer[.]]

~~wherein the control element monitors insertion or removal of the at least one sample during processing protocol steps.~~

26. (Cancelled)

27. (Currently Amended) A method according to claim 25, wherein said step ~~of providing an~~ optical sensor comprises ~~the step of utilizing~~ a camera.

28. (Currently Amended) A method according to claim 25, wherein said step ~~of providing an~~ optical sensor comprises ~~the step of utilizing~~ a CCD element.

29. (Currently Amended) A method according to claim 25, ~~[[and]]~~ further comprising ~~[[the]]~~ a step of storing an image relevant to ~~[[a]]~~ the staining process of staining tissue samples.

30. (Currently Amended) An automatic staining apparatus comprising:
at least one reagent container positioned within a reagent section;
at least one sample, the sample being placed on a slide positioned within a slide section;

~~[[a]] wherein the robotic element adapted to affect said reagent container and~~
said sample is configured to move above the reagent section and above the slide section during a staining process;

wherein the reagent section is situated to enable the at least one reagent container to be added to or removed from the apparatus without interrupting the movement of the robotic element during the staining process;

~~a control element to which said robotic element is responsive;~~

wherein the robotic element comprises a multifunction optical sensor configured to sense at least one element in said automatic staining apparatus automatically identify new slides and reagent bottles loaded into the apparatus during the staining process;

[[and]]

~~a computer image biological analysis element[[.]]; and~~

~~wherein the multifunction optical sensor automatically identifies insertion of new slides and new reagent containers to the staining apparatus~~

a control element to which the robotic element is responsive, the control element configured to monitor insertion or removal of the at least one reagent container during the staining process.

31. (Cancelled)

32. (Original) An apparatus according to claim 30, wherein said optical sensor comprises a camera.

33. (Original) An apparatus according to claim 30, wherein said optical sensor comprises a CCD element.

34. (Currently Amended) An apparatus according to claim 30, ~~[[and]]~~ further comprising a stored image relevant to the staining process of staining tissue samples.

35. (Currently Amended) An automatic staining apparatus comprising:
at least one removable reagent container positioned within a reagent section;
at least two staining sections separated by the reagent section;
at least one sample placed on a slide in a slide rack, the slide rack being positioned within the staining sections;

~~at least two staining sections separated by the reagent section;~~
~~[[a]] wherein the robotic element adapted to affect said reagent container and said sample is configured to move above the reagent section and above the staining sections during a staining process;~~

wherein the reagent section is situated to enable the at least one reagent container to be added to or removed from the apparatus without interrupting the movement of the robotic element during the staining process;

~~a control element to which said robotic element is responsive; and~~
wherein the robotic element comprises an image capture 2-D optical sensor configured to two dimensionally image at least one element in said automatic staining apparatus; automatically identify new slides and reagent bottles loaded into the apparatus during the staining process; and

a control element to which the robotic element is responsive, wherein the control element monitors configured to monitor insertion or removal of the at least one slide

~~rack during processing protocol steps~~ removable reagent container during the staining process.

36. (Currently Amended) A method of staining tissue samples in an automatic staining apparatus comprising the steps of:

providing at least one slide positioned within a slide section;

providing at least one removable reagent container positioned within a reagent section;

~~providing a wherein the~~ robotic element adapted to affect said slide and said ~~reagent container~~ is configured to move above the reagent section and above the slide section during a staining process;

wherein the at least one reagent container is be added to or removed from the apparatus without interrupting the staining process;

providing the robotic element with an optical sensor ~~responsive to said robotic element and adapted to sense a two dimensional image of at least one element in said automatic staining apparatus~~ configured to automatically identify new slides and reagent bottles loaded into the apparatus during the staining process;

recording relevant image data; and

feeding said image data to a control element to which said robotic element is responsive, ~~wherein the control element monitors~~ configured to monitor insertion or removal of the at least one ~~slide and the at least one~~ removable reagent container during ~~processing protocol steps~~ the staining process.

